

IN THE CLAIMS:

*Please find below a listing of all of the pending claims. The statuses of the claims are set forth in parentheses.*

1. (Currently Amended) A data storage device comprising:
  - a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer;
  - an energy source positioned proximate to the data storage medium; and
  - a nanometer-scaled data bit including an opening extending through a portion of the second layer.
2. (Original) The data storage device of claim 1, wherein the first layer comprises a conducting material.
3. (Currently Amended) The data storage device of claim ~~2~~ 6, wherein the second layer comprises an electrically resistive material.
4. (Currently Amended) The data storage device of claim ~~2~~ 6, wherein the second layer comprises a material having a first state and a second state.
5. (Original) The data storage device of claim 1, wherein the second layer comprises a thickness of between 2 and 100 nanometers.

6. (Currently Amended) ~~The data storage device of claim 1, wherein the second layer~~  
~~comprises~~ A data storage device comprising:

a data storage medium that includes a first layer at a surface of the storage  
medium and a second layer between the first layer and a third layer;

an energy source positioned proximate to the data storage medium; and

a nanometer-scaled data bit extending through a portion of the second layer,  
the second layer including a first region that includes a phase-change material and a second  
region that includes a resistive material with a resistivity value midway between the  
resistivity value of a first phase of the phase-change material and a second phase of the  
phase-change material.

7. (Original) The data storage device of claim 1, wherein the second layer comprises a  
thermally insulating material.

8. (Currently Amended) The data storage device of claim ~~4~~ 6, wherein the data bit  
comprises a material in a state different from the state of the second layer.

9. (Canceled)

10. (Currently Amended) ~~The data storage device of claim 1, further comprising~~ A  
data storage device comprising:

a data storage medium that includes a first layer at a surface of the storage  
medium and a second layer between the first layer and a third layer;

an energy source positioned proximate to the data storage medium;

a nanometer-scaled data bit extending through a portion of the second layer;

and

a third layer adjacent to the second layer and a fourth layer adjacent to the third layer.

11. (Original) The data storage device of claim 10, wherein the data bit extends through a portion of the fourth layer.

12. (Original) The data storage device of claim 1, wherein the second layer comprises at least one of a photoconductive material and a cathodoconductive material.

13. (Original) The data storage device of claim 1, wherein the second layer comprises at least one of a photoluminescent material and a cathodoluminescent material.

14. (Original) The data storage device of claim 1, wherein the energy source comprises at least one of a field emitter, a Spindt emitter, and a Schottky emitter.

15. (Original) The data storage device of claim 1, further comprising at least one of a secondary energy emitter and a heating element positioned proximate to the storage medium.

16. (Currently Amended) A method of storing data comprising:

providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer;

writing a nanometer-scaled data bit including an opening in the second layer by bombarding the storage medium with a high-power-density beam; and

reading the data bit by bombarding the data storage medium with a low-power-density beam.

17. (Original) The method of claim 16, wherein the writing step further comprises forming a hole through the first layer and the second layer.

18. (Currently Amended) The method of claim ~~16~~ 30, wherein the writing step further comprises changing a portion of the second layer from a first state to a second state.

19. (Currently Amended) ~~The method of claim 16, wherein the reading step further comprises~~ A method of storing data comprising:

providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer;

writing a nanometer-scaled data bit including an opening in the second layer by bombarding the storage medium with a high-power-density beam; and

reading the data bit by bombarding the data storage medium with a low-power-density beam and monitoring how much electric current flows through the third layer.

20. (Currently Amended) ~~The method of claim 16, wherein the reading step further comprises~~ A method of storing data comprising:

providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer;

writing a nanometer-scaled data bit including an opening in the second layer by bombarding the storage medium with a high-power-density beam; and

reading the data bit by bombarding the data storage medium with a low-power-density beam and comparing how much electric current flows through the first layer compared to the third layer.

21. (New) A system of storing data comprising:

means for providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer;

means for writing a nanometer-scaled data bit including an opening in the second layer by bombarding the storage medium with a high-power-density beam; and

means for reading the data bit by bombarding the data storage medium with a low-power-density beam.

22. (New) The system of claim 21, wherein the means for writing further comprises means for forming a hole through the first layer and the second layer.

23. (New) The system of claim 21, wherein the means for writing further comprises means for changing a portion of the second layer from a first state to a second state.

24. (New) The system of claim 21, wherein the means for reading further comprises means for monitoring how much electric current flows through the third layer.

25. (New) The system of claim 21, wherein the means for reading further comprises means for comparing how much electric current flows through the first layer compared to the third layer.

26. (New) The data storage device of claim 6, wherein the first layer comprises a conducting material.

27. (New) The data storage device of claim 6, further comprising a third layer adjacent to the second layer and a fourth layer adjacent to the third layer.

28. (New) The data storage device of claim 6, wherein the energy source comprises at least one of a field emitter, a Spindt emitter, and a Schottky emitter.

29. (New) The data storage device of claim 6, further comprising at least one of a secondary energy emitter and a heating element positioned proximate to the storage medium.

30. (New) A method of storing data comprising:

providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer, the second layer

including a first region that includes a phase-change material and a second region that includes a resistive material with a resistivity value midway between the resistivity value of a first phase of the phase-change material and a second phase of the phase-change material;

writing a nanometer-scaled data bit in the second layer by bombarding the storage medium with a high-power-density beam; and

reading the data bit by bombarding the data storage medium with a low-power-density beam.

31. (New) A system of storing data comprising:

means for providing a data storage medium that includes a first layer at a surface of the storage medium and a second layer between the first layer and a third layer, the second layer including a first region that includes a phase-change material and a second region that includes a resistive material with a resistivity value midway between the resistivity value of a first phase of the phase-change material and a second phase of the phase-change material;

means for writing a nanometer-scaled data bit in the second layer by bombarding the storage medium with a high-power-density beam; and

means for reading the data bit by bombarding the data storage medium with a low-power-density beam.